UPPER KOSHKONONG CREEK WATERSHED (LR12)

Patrick Marsh: a DOT restored lake/wetland

The creek drains 107 square miles including: a large portion of eastern Dane County including the communities of Sun Prairie, Cottage Grove, and Deerfield, a number of small subdivisions, and a glacial drumlin-marsh area. Land use is primarily agricultural and a large percentage of original wetlands have been drained for this purpose. This wetland loss, coupled with stream ditching and widespread use of field tiles, allows significant nutrient and sediment loads to reach surface waters in this and downstream watersheds. A detailed study of the water quality in the Upper Koshkonong was conducted in 1981 by the University of Wisconsin Institute for Environmental Studies, which enumerated sources and causes of pollution affecting the creek.

This watershed is experiencing rapid population growth in the City and Town of Sun Prairie and the Village and Town of Deerfield. The Towns of Deerfield and Sun Prairie have soil erosion rates of 8.9 and 7.0 tons/acre/year, respectively. This watershed has a medium susceptibility for groundwater contamination based on WDNR groundwater susceptibility mapping.

Blue joint grass

Table 1. Municipalities in the Upper Koshkonong Creek Watershed (LR12)

Municipality	County	1995 Population	2000 Population	Percent Growth 1995 - 2000
City of Sun Prairie	Dane	17,426	20,369	16.9
Town of Sun Prairie	Dane	2,016	2,308	14.5
Village of Deerfield	Dane	1,747	1,971	12.8
Town of Deerfield	Dane	1,324	1,470	11.0
Town of Medina	Dane	1,192	1,235	3.6

Sun Prairie is experiencing rapid growth

City of Sun Prairie

The city of Sun Prairie is growing rapidly, especially on its west side: 16.9% over the five-year period from 1995 to 2000. To respond to this growth, the city in 1994 adopted a neighborhood plan and proposed sewer service area amendments that added 948 acres of land west of the existing city while taking about 1,081 acres out of the urban service area from the city's south and eastern border (DCRPC 1994). Drainage in the northern portion of the west side addition flows to Token Creek, which is one-half mile away. The southern portion of the addition drains to Upper Koshkonong Creek. A 1994 analysis of this change recommended additional stormwater management planning to better address water quality protection and groundwater recharge functions, especially in the Token Creek watershed (DCRPC 1994). Most of the city's efforts to address water resources issues prior to 1995 were quantity related, such as its stormwater ordinance and previous stormwater planning efforts.

A bioswale: a method of reducing stormwater runoff into lakes and streams

The city is currently working on both stormwater quantity and quality plans funded by different sources, reflecting the two basins into which the city's water drains. Quantity planning is funded by the Federal Emergency Management Agency (FEMA) to develop up-to-date floodplain zone maps for stormwater entering the entire Koshkonong Creek Watershed. Stormwater quality work is funded through the Lake Mendota Priority Watershed Project for portions of the city draining to Lake Mendota via Token Creek. The quality work consists of locating and sizing stormwater management facilities in areas of existing development and proposing theoretical systems in undeveloped portions of the urban service area. The goals are to attenuate downstream peak flows, improve the quality of stormwater, and ensure that new developments are consistent with these goals (WDNR).

Village of Deerfield

In 1992, the village of Deerfield installed a new public well after the state found groundwater contamination in an existing well. Through the state Environmental Repair Fund WDNR investigated a plume of contaminants in groundwater beneath the village and traced the source back to onsite disposal practices. In 1994, the Sta-Rite property was declared the source of volatile organic compounds that had leached into a public well. Negotiations for developing a cleanup plan are under way.

STREAMS

Koshkonong Creek: ditched and sluggish with siltation on the left bank

Koshkonong Creek (Upper) Rising on the east edge of the city of Sun Prairie, much of the creek's headwaters are ditched and straightened. This river exhibits natural limiting conditions as well, such as a flat gradient, low base flow, warm temperatures, and high inputs of sediment and nutrients from the fertile watershed. Agricultural land use, urban development and hydrologic modifications result in sluggish flows, river stretches clogged with debris, and overall poor water quality. Most of its tributary streams have also been ditched and are also clogged with debris. The creek's substrate consists of thick silt, probably washed from nearby farm fields, and sludge from the Sun Prairie wastewater treatment plant lying over gravel.

Above County Trunk Highway T the creek supports a few tolerant forage species. From its headwaters to Hwy. T, the river is classified as supporting limited aquatic life, or marginal surface waters. Although the stream is marginal, Hilsenhoff Biotic Index data from 1989 indicated water quality in the stream improved from “very poor” to “poor.” Base flow monitoring in 1990 showed high levels of phosphorus, chloride, fecal coliform bacteria, ammonia-nitrogen, and nitrate-nitrogen at the Baily Road monitoring site (DCRPC 1995).

Below Highway T, Koshkonong Creek is classified as a warm water sport fishery, though it is severely affected by polluted runoff and past point source discharges. Research into water quality improvements from the upgrade of the Sun Prairie wastewater treatment plant examined aquatic insects via the Hilsenhoff Biotic Index and the stream's chemical water quality. These studies showed improvement in water quality based on chemical parameters only. The biotic index indicated less improvement than anticipated, possibly due to the persistent effects of sludge deposits on the stream bottom coupled with ongoing polluted runoff.

Stream with silt deposits

Mud Creek is a ditched tributary to Koshkonong Creek. Historically, the creek wove through interconnected wetlands, some supporting northern pike spawning. Many of these wetlands have been drained for agriculture. Agricultural polluted runoff is the primary threat to existing water quality. Surveys in 1984 and 1988 show the stream receives an abundant silt load from agricultural fields, reducing aquatic and fish habitat. The stream also exhibits extreme flow fluctuations after major storms. The stream was classified as an intermediate surface water, supporting a limited forage fishery, but was reclassified as a warm water forage fishery in 1988, indicating water quality improvement.

Resources of Concern (LR12)

WDNR's Heritage Resources Database indicates that the following water-dependent endangered, threatened or special concern species and/or communities have been sighted in this watershed within the last 20 years.

Table 2. Endangered, Threatened or Communities of Special Concern

Banded killifish

Community	Location	Indicator Species/Description
Northern Wet Forest, Emergent Aquatic, Southern Sedge Meadow, Shrub-Carr, Open Bog	Goose Lake (State Wildlife Area)	Small shallow lake bordered by a semi-floating mat of wiregrass sedge (*Carex lasiocarpa*) cattail *(Typha latifolia*) and blue joint grass (*Calamagrostis canadensis*). South and west of the lake are stands of dense shrubs and tamarack. Near the south end is a small bog.
Lake-shallow, seepage, Northern Wet Forest, Emergent Aquatic, Southern Dry-Mesic Forest	Mud Lake (Deerfield)	Shallow lake located east of a wooded drumlin in an outwash valley. Northwest edge is wooded with a tamarack swamp, east side is abandoned farmland. Banded killifish, green sunfish, largemouth bass and northern redbelly dace among the fish in the lake.

RECOMMENDATIONS

The Dane County Regional Planning Commission has developed a set of specific recommendations for abating polluted runoff from Dane County communities. This list should also be considered by communities when planning water quality work and budget items.

Green sunfish

1. The Lower Rock River Basin Team should evaluate acquisition of additional acreage in the Upper Koshkonong Creek drainage area under the Stewardship Fund for wetland restoration and habitat improvement. [1]

2. The Lower Rock River Basin Team should conduct a triennial standards review on the water quality variance reach of Koshkonong Creek prior to the next WPDES permit reissuance for the Sun Prairie wastewater treatment plant. [1]

3. The Lower Rock River Basin Team should conduct a triennial standards review on the effluent ditch to Mud Creek before the next WPDES permit reissuance for the Deerfield wastewater treatment plant.[1]

Largemouth bass

4. The Lower Rock River Basin Team should sample sediment for toxics in Koshkonong Creek below the Sun Prairie wastewater treatment plant outfall. [1]

5. The city of Sun Prairie should vigorously enforce its erosion control ordinance. [2]

6. Sun Prairie should review recommendations in the report *Upper Koshkonong Creek: a Watershed Management Study* (1982) to determine needed work to improve Koshkonong Creek. [2]

1. These recommendations are a basis for work planning or other decisions, which must be approved by the appropriate DNR division administrator (the recommendations are a starting point for the work planning process.

2. These recommendations are advisory to the public, local governments, lake management organizations, and other groups or agencies. These recommendations are not binding. No statutory or codified requirements exist

Cattails and lilies

ACKNOWLEDGMENTS

Dave Marshall and Mike Sorge contributed his knowledge and expertise to this report.

Photo credits: City of Cambridge (Patrick's Marsh); WI Remediation and Redevelopment Outreach Library (city block drawing); WDNR (bioswale, Koshkonong Cr., silted stream); Konrad Schmidt (banded killifish, modified by Isa Woo); Mike Sorge (green sunfish, largemouth bass, redbelly dace); Virginia Kline's Vegetation of Wisconsin Collection (cattail/lilies, blue joint grass); Robert Savannah/US Fish and Wildlife Service (geese illustration).

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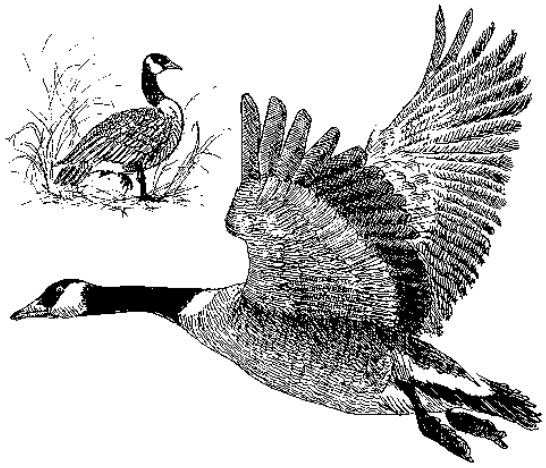

Table 3. Streams in the Upper Koshkonong Creek Watershed (LR12)

Stream Name	WBIC	County	Length (Miles)	Existing Use (Miles)	Potential Use (Miles)	Supporting Potential Use (Miles)	Current Codified Use	303(d) Status	Use Impairment		Data Assess-ment	Data Level	Trend	References
									Source	Impact				
Koshkonong Creek- Upper	0808800	Dane	0 - 23	WWSF/23	Same	Part	LAL	N	HM, CL, PSB, BY, NPS,	TURB, DO, NUT, SED, HAB, TEMP, BAC, MAC	M	B2 H2 C2	S	10, 12, 14, 17, 23, 33, 35, 36, 37, 44, 64, 83
			23 - 29	LAL/6	Same	Full	LAL	N	CE, URB, PSM, NPS, HM, CL, BY	DO, FLOW, HAB, BAC, TEMP, TURB, MAC, SED, NUT	M	B2 H2 C2	S	
Mud Creek	0810300	Dane	9	WWFF/9	Same	Part	LFF	N	HM, CL, SB, BY, NPS	FLOW, DO, HAB, TURB, SED, TEMP, MAC, BAC, NUT	E	B3 H2 C2	S	10, 12, 14, 17, 23, 33, 36, 37, 44, 64, 83
15 Unnamed Streams			35											

Table 4. Lakes in the Upper Koshkonong Creek Watershed (LR12)

Lake Name	County	Town, Range, Section	WBIC	Surface Area (Acres)	Max Depth (ft)	Mean Depth (ft)	Lake Type	Winter kill	Acc-ess	SH	Hg	Mac	LMO	TSI	TSI Class	Lake Plan Prot	P Sens	Impairment		Comments
																		Source	Impact	
Goose Lake	Dane	T07NR12E S02	0810200	61	2	1	SE	--	--	X	GA	--	--	--	--	--	II Ins	--	--	State Wildlife Area
Mud Lake	Dane	T07NR12E S02	0810700	34	8	3	SE	Y	T	--	GA	--	--	--	--	--	II B	--	--	Goose Lake Public Hunting Grounds; excellent waterfowl habitat
Patrick Lake/Marsh	Dane	T08NR11E S6	0774800	170	--	--	SE	--	--	--	GA	--	--	--	--	--	--	URB, RS	--	Patrick Marsh (Brazee Lake) DOT restored wetland